

# POINTERS

Once you have written your first draft ..... **EDIT YOUR PAPER!!!**

*"In my writing, I average about ten pages a day.  
Unfortunately, they're all the same page."  
Michael Alley, The Craft of  
Scientific Writing*

A major part of any writing assignment consists of re-writing.

## **Write accurately:**

**1. Scientific writing must be accurate.** Although writing instructors may tell you not to use the same word twice in a sentence, it's okay for scientific writing, which must be accurate. (A student who tried not to repeat the word "hamster" produced this confusing sentence: "When I put the hamster in a cage with the other animals, the little mammals began to play.")

## **2. Make sure you say what you mean.**

Instead of: The rats were injected with the drug. (sounds like a syringe was filled with drug and ground-up rats and both were injected together)  
Write: I injected the drug into the rat.

## **3. Be careful with commonly confused words:**

Temperature has an effect on the reaction.  
Temperature affects the reaction.

I used solutions in various concentrations. (The solutions were 5 mg/ml, 10 mg/ml, and 15 mg/ml)

I used solutions in varying concentrations. (The concentrations I used changed; sometimes they were 5 mg/ml, other times they were 15 mg/ml.)

Less food (can't count numbers of food)  
Fewer animals (can count numbers of animals)

A large amount of food (can't count them)  
A large number of animals (can count them)

The erythrocytes, which are in the blood, contain hemoglobin.  
The erythrocytes that are in the blood contain hemoglobin. (Wrong. This sentence implies that there are erythrocytes elsewhere that don't contain hemoglobin.)

## **Write clearly:**

### **1. Write at a level that's appropriate for your audience.**

"Like a pigeon, something to admire as long as it isn't over your head." Anonymous

### **2. Use the active voice. It's clearer and more concise than the passive voice.**

Instead of: An increased appetite was manifested by the rats and an increase in body weight was measured.

Write: The rats ate more and gained weight.

### **3. Use the first person.**

Instead of: It is thought

Write: I think

Instead of: The samples were analyzed

Write: I analyzed the samples

### **4. Avoid dangling participles.**

"After incubating at 30 degrees C, we examined the petri plates." (You must've been pretty warm in there.)

## **Write succinctly:**

### **1. Use verbs instead of abstract nouns**

Instead of: take into consideration

Write: consider

### **2. Use strong verbs instead of "to be"**

Instead of: The enzyme was found to be the active agent in catalyzing...

Write: The enzyme catalyzed...

### **3. Use short words.**

*"I would never use a long word where a short one would answer the purpose. I know there are professors in this country who 'ligate' arteries. Other surgeons tie them, and it stops the bleeding just as well."*

*Oliver Wendell Holmes, Sr.*

Instead of:	Write:
possess	have
sufficient	enough
utilize	use
demonstrate	show
assistance	help
terminate	end

#### 4. Use concise terms.

Instead of:	Write:
prior to	before
due to the fact that	because
in a considerable number of cases	often
the vast majority of	most
during the time that	when
in close proximity to	near
it has long been known that	I'm too lazy to look up the reference

#### 5. Use short sentences. A sentence made of more than 40 words should probably be rewritten as two sentences.

*"The conjunction 'and' commonly serves to indicate that the writer's mind still functions even when no signs of the phenomenon are noticeable."*  
*Rudolf Virchow, 1928*

#### **Check your grammar, spelling and punctuation:**

##### 1. Use a spellchecker, but be aware that they don't catch all mistakes.

"When we consider the animal as a hole,..." Student's paper

2. **Your spellchecker may not recognize scientific terms.** For the correct spelling, try Biotech's Life Science Dictionary or one of the technical dictionaries on the reference shelf in the Biology or Health Sciences libraries.

##### 3. Don't, use, unnecessary, commas.

##### 4. Proofread carefully to see if you any words out.

## USEFUL BOOKS

Victoria E. McMillan, Writing Papers in the Biological Sciences, Bedford Books, Boston, 1997.

*The best option.*

Jan A. Pechenik, A Short Guide to Writing About Biology, Boston: Little, Brown, 1987

Harrison W. Ambrose, III & Katharine Peckham Ambrose, A Handbook of Biological Investigation, 4th edition, Hunter Textbooks Inc, Winston-Salem, 1987

*Particularly useful if you need to use statistics to analyze your data.*

Robert S. Day, How to Write and Publish a Scientific Paper, 4th edition, Oryx Press, Phoenix, 1994.

*Earlier editions also good. A bit more advanced, intended for those writing papers for publication. Fun to read.*

William Strunk, Jr. and E. B. White, The Elements of Style, 3rd ed. Macmillan, New York, 1987. *Strunk's first edition is available on-line.*

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